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ABSTRACT

A review of the Environmental Education (EE) program for the first four years of Youth Conservation Corps (YCC) identified a number of things: (1) despite national guidelines, EE programs varied greatly from camp to camp in both quantity and quality; (2) many camps needed some assistance to help them translate their somewhat vague EE goals into a clearly specified educational program for enrollees; (3) the national Environmental Awareness Test was not adequate to the tasks of providing summary data on the program and diagnostic feedback to individual camps. A solution to these problems was proposed in the summer of 1975 and tested in four camps. The solution involves each camp defining its EE program as a collection of behavioral objectives -- statements which describe specific outcomes which the camp staff think can be achieved by the enrollees. The behavioral objectives for each camp are unique, yet they follow the broad guidelines for EE programs supplied by Washington. A camp's objectives are entered into a scorecard which is used during the season to track individual enrollee progress. The information from all enrollees is summarized by the camp staff at the end of the summer and used to modify the program for the coming season. Included in the publication are samples of scorecards, suggestions for effective use, and samples of data from camps where they were used. (Author/RH)

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THE ENVIRONMENTAL LEARNINGS SCORECARD
A Behavioral Objectives Approach to Defining and Evaluating the Environmental Education Program for the Youth Conservation Corps

Jerome Johnston

A report prepared for the national offices of the Youth Conservation Corps under a grant from the U.S. Forest Service. The conclusions and recommendations are those of the author and do not at the time of this writing represent official policy of the Youth Conservation Corps.

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Ann Arbor, Michigan

October, 1975

SUMMARY

A review of the EE program for the first four years of YCC identified a number of things: (1) despite national guidelines, EE programs varied greatly from camp to camp in both quantity and quality; (2) many camps needed some assistance to help them translate their somewhat vague EE goals into a clearly specified educational program for enrollees; (3) the national Environmental Awareness Test was not adequate to the tasks of providing summary data on the program and diagnostic feedback to individual camps. A solution to these problems was proposed in the summer of 1975 and tested in four camps. The solution involves each camp defining its EE program as a collection of behavioral objectives--statements which describe specific outcomes which the camp staff think can be achieved by the enrollees. The behavioral objectives for each camp are unique, yet they follow the broad guidelines for EE programs supplied by Washington. A camp's objectives are entered into a scorecard which is used during the season to track individual enrollee progress. The information from all enrollees is summarized by the camp staff at the end of the summer and used to modify the program for the coming season.

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THE NEED FOR SOME CHANGES IN THE EDUCATION AND TESTING PROGRAM

An integral part of the Youth Conservation Corps program is teaching enrollees about the environment. Since the program's beginning there has been a test of environmental knowledge administered to enrollees at the beginning and end of the camp session. The purpose of this test has been to provide program managers (and ultimately Congress) with a measure of how much enrollees learn about the environment during their stay in YCC. The test has been revised several times since 1971 when the YCC program began. However, this test has failed to fulfill all the needs and expectations of those responsible for the program. There are a number of reasons for this which have been recently identified; these are detailed below.

(1) There has never been a curriculum common to all camps in the YCC program. The YCC program has thrived under a policy of decentralization of responsibility, with Washington providing only broad guidelines for the operation of camps. This is true especially in environmental education. The curriculur guidelines (1971-1975) have been very general, and the training for EE instructors has been brief and suggestive, with encouragement given for taking local initiative. The EE *Source Book* which is sent to each camp is a collection of good teaching ideas from which an instructor can pick and choose; but the utilization of this document has varied greatly, with some EE instructors never using the book at all. In part this *laissez faire* curriculur policy has been consciously chosen by Washington with the quite defensible view that it would result in a strong program. Another reason for this policy is the uncertainty about what should be taught; even the "experts" in the area of environmental education disagree on what citizens should know to be responsive to national needs in this area. The result of all this has been a very diverse program, with enrollees learning many different things depending mostly on which camp they attended. This may be quite appropriate as an educational outcome but it has implications for a national testing program. An assumption that underlies the use of any standardized achievement test is that all people who are tested are taught the same material, and that variation in achievement can be attributed to either student ability and motivation, or to the quality of the teaching program. Since it is clear (with the benefit of hindsight) that YCC enrollees are not taught the same material, a single national test is inappropriate.*

*This judgment may change at some time in the future. It is conceivable that in coming years principles could emerge from the scientific and political communities on which there is some national consensus. In principle, a single national test could then be used. However, there are other reasons why one might not want to choose a single test even if a uniform curriculum does develop.

(2) Many educational goals in YCC cannot be measured by a paper-and-pencil test. Looking at the national guidelines for environmental education, it is clear that many of the objectives defy easy measurement by traditional methods. For example, one goal is that enrollees identify an environmental problem which is unique to the area in which the camp is located (Objective 6b, 1974 Program Handbook). Another example is current Objective 9, "Apply the concepts of an environmental impact statement to specific programs and land areas with which [the enrollee] is familiar." Both of these educational goals are quite appropriate, the only problem lies in trying to measure the achievement of the goal. Clearly the best judge of achievement of either of these objectives is the instructor, not an outside evaluator looking at the responses to a multiple-choice question.

(3) A lengthy school-like test violates the spirit of the YCC approach. For evaluation purposes, the test has been administered at the very beginning of camp and again at the very end of camp. The first testing comes at a time when most enrollees have just finished a year of intensive schooling. They are tired of school and the kinds of activities undertaken there, and they are looking forward to a different kind of summer experience in YCC. To begin camp activities with a test which takes considerable time to complete can get things off to a bad start. At the very least, it can be said that the test does not contribute to creating good morale among enrollees when they first come to camp. At the end of camp there is a different kind of problem. The uniqueness of each camp's curriculum means that the test will not measure many of the things that have been learned so the test is seen as irrelevant by enrollees and again it contributes little to either the campers' morale or the staff's support for the testing program.

With all of these problems it was clear that a new approach needed to be taken to the area of evaluation of environmental education. The approach needed to be a fresh one, which would not soon be rejected for similar kinds of problems. Scanning the field of traditional educational testing, no solutions were seen short of dropping all forms of evaluation. It was clear that any type of evaluation had to take into account the much more basic problem of defining what the environmental education program was. In addition it needed to take into account the uniqueness of each camp's program, and ideally even assist camps in developing a clearly thought out program for the enrollees. The solution was seen in the blending of several innovations which have become popular in the field of education over the past few years. These include the notions of student behavioral objectives, minimal competencies, criterion-referenced testing, and individualized instruction. Briefly, the result of this thinking is a program in which each camp defines its environmental education program in terms of a collection of behavioral objectives, and the achievement of these objectives are monitored by use of a "scorecard." This approach to environmental education was experimented with in the summer of 1975 in four YCC camps, two from Forest Service and two from the Department of the Interior. The experiment was evaluated and judged to be an innovation worthy of implementation in the larger YCC program. Below, the behavioral objectives approach and the scorecard are described in more detail.

THE SCORECARD PROGRAM IN BRIEF

To understand the scorecard program the reader should be familiar with three key terms.

Behavioral Objective. A behavioral objective is a statement which describes an action to be performed by a learner; in the case of YCC, a behavioral objective is an action which a YCC enrollee must perform to fulfill a goal of the environmental education program.

A Behavioral Objectives Approach. Following a behavioral objectives approach, each camp generates a collection of behavioral objectives. In choosing the content areas for these objectives the camp staff follows the broad outline provided in the Environmental Awareness Guidelines found in the *Source Book*. The set of objectives completely defines the camp's environmental education program. The result is a program in each camp which is tailored to meet the unique strengths of the staff, the available resources, and the work projects which need to be done.

Scorecard. For record-keeping purposes, the camp's objectives are entered into a scorecard -- a simple device on which each enrollee tracks his progress by having a staff person initial each objective when it is satisfactorily accomplished.

The behavioral objectives to EE program development in YCC will result in a national program which will have both unity and diversity. Since each camp staff will follow the same national guidelines for EE programs, all camps will have similar programs in that certain content areas and principles will be covered. At the same time each camp program will be unique in that the ways which enrollees experience or learn about these topics will vary greatly from camp to camp.

The method of defining the environmental education program in terms of behavioral objectives can be thought of as a results-oriented approach to teaching. In most educational programs, the goals of the program are stated in terms of broad areas of content which are to be covered by the teacher. A teacher then translates these into more specific plans of action which describe what the teacher will do to cover the material. Usually these plans do not describe what outcomes will be expected of the learner as a result of being exposed to the teacher's actions. In contrast, behavioral objectives describe specific expectations for the learner. Some examples may clarify these distinctions.

Program description:	The program will cover the analysis of soils including the use of a Lamotte Soil Testing kit.

Teacher plan:	Show enrollees how to analyze soils using the Lamotte Soil Testing kit. Draw samples from soil pit behind mess hall. Cover the basic characteristics of soils.
Student/enrollee behavioral objective:	Using the Lamotte Soil Testing kit the enrollee will analyze a sample of soil and identify its (1) texture, (2) structure, (3) Ph, (4) temperature, and (5) color. The enrollee will also specify two ways in which man can alter each of these five soil characteristics.

The program description describes the general content area which will be covered in the course of program. The teacher plan does not say much more because it is only an outline for the teacher. The words should be sufficient to remind the teacher of material which he has in mind to cover; people other than the teacher would have difficulty determining at what "level" the instruction would be conducted. Defining what the teacher expected from students would entail attending the class presentation and examining the assessment instrument--the test in which the expectations are made quite explicit. In contrast, the behavioral objective tells a reader immediately what will be expected of a learner. It is clear from the statement that a learner will not be expected to become a soil scientist, but then again he must do much more then simply attend a lecture on soils. In order to tell the learner the specifics contained in the behavioral objective, the teacher (camp staff) has had to think through in advance precisely what will be expected from enrollees.

The behavioral objectives approach entails a camp staff generating a complete set of objectives for the environmental education program and entering these into a scorecard which is used by the staff and enrollees to guide the program through the season. An example of a portion of a scorecard from the 1975 experiment is shown on the next page. The complete scorecards from all four camps can be found in the appendix.

TRYING THE BEHAVIORAL OBJECTIVES APPROACH IN FOUR CAMPS

The behavioral objectives approach and the accompanying scorecard were appealing on paper, but it was unclear whether they would work well in the field. In June of 1975, they were implemented on an experimental basis in four camps: two from Forest Service and two from Interior. The author visited each of the four camps and provided training for selected staff in the writing of behavioral objectives. In addition he helped the staffs write their own set of behavioral objectives for their Environmental Education Program. This took place during a staff training

PORTION OF A SCORECARD

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD

	Date and Staff Initials
SOILS	
1. Using a soil sample kit: a. Correctly draw a sample of soil b. Identify the Ph, Nitrogen, Phosphorous and Potassium levels in the sample	_____
2. Correlate flora with soil type, identifying two species that correspond to each part of the Ph range.	_____
3. Explain what indicator species tell you about soil Ph in an area.	_____
4. Define succession.	_____
5. Define and distinguish among sand, silt, clay, humus.	_____
6. As a part of a sedimentation study, determine the fractions of each soil type.	_____
INVERTEBRATES IN WILDLIFE AREAS	
7. On visits to four different areas: a. Collect invertebrates in a "kill" jar b. Identify the characteristics of each invertebrate (body, legs, wings, and other obvious external features)	_____
8. Develop a dichotomous key for the invertebrates.	_____
9. Describe ways in which the invertebrates of each area are the same or different and give reasons for the difference.	_____
DRIGGS RIVER VISIT	
10. a. Using a compass, determine the location of N, E, S, W.	_____
b. Using the sun and physical features, get to the Driggs River from your starting point.	_____

week which preceded the arrival of enrollees. The drafts of each of the four scorecards were then taken to Ann Arbor where they were typed and duplicated, along with other materials necessary to run the scorecard program (instruction sheet and master scorecard). These materials were returned to the camps by the second week of their program. During the summer, the staff tried to conduct their entire program in environmental education following the scorecard which they had designed. The key people in each camp were instructed to keep track of reactions to the scorecard, anticipating a debriefing session in the fall of 1975.

ENDORSEMENT OF THE BEHAVIORAL OBJECTIVES APPROACH AND THE SCORECARD

In September a meeting was held in Ann Arbor which was attended by representatives from the four camps and from Washington. These people included Environmental Education instructors, camp directors, project officers, and national people responsible for both evaluation and program implementation. The conclusion of this group is that the behavioral objectives approach should be expanded gradually throughout the YCC program so that all camps will eventually describe their EE program as a collection of behavioral objectives entered into a scorecard. This conclusion is based on the following positive benefits of this approach.

Advantages. The biggest advantage to be realized from this approach is that it forces teachers (EE instructors, camp directors, and crew leaders) to think through in detail the entire EE program prior to the arrival of campers. In the process of doing this, a staff must share and reach some concensus on philosophies of education, ecological priorities, and the fundamental knowledge base for a program in environmental education. In addition, the staff is helped to think through in advance the ecological significance of each work project, a sometimes elusive goal of the YCC program. This type of planning is essential in a program such as YCC which lasts for only four to eight weeks, and which operates at a very rapid pace during that time.

In addition to planning advantages, the approach encourages spreading the teaching responsibilities throughout the staff. This can occur because prior to the beginning of camp, the staff discusses both the philosophy and content, so that the EE program is not the private domain of the EE instructor. Inasmuch as some of the score keeping is done by crew leaders, the the sense of participation of all staff in the Environmental Education Program is heightened. Another potential of the scorecard approach is that the responsibility for learning can be pushed even farther away from the EEI by securing the participation of the learner himself in the educational process. This can occur when learners are made to feel that it is partly their responsibility to complete the behavioral objectives and seek out a staff person to obtain certification when he or she feels that the objective can be well demonstrated. When data from the scorecard are summarized in the recommended fashion, the data can serve as a helpful diagnostic tool for revising the EE program for a succeeding year.

RECOMMENDATIONS FOR IMPLEMENTING THE PROGRAM

There are a number of specific recommendations coming out the 1975 pilot program. These are described below and should be followed if it is decided to expand the behavioral objectives program in future years.

TRAINING CAMP STAFFS

The term "behavioral objective" is not familiar to most people, even to many who are educators; thus, training in recognizing and writing behavioral objectives is essential to the program. Additional training is necessary to introduce camp staffs to the scorecard approach.

Spring training. An introduction to behavioral objectives and the scorecard approach should be given to all participants in spring training. In the past, camps participating in this training have been represented by three people: a camp director, environmental education instructor, and a project manager. While the EE program is usually the responsibility of the EE instructor, there is good reason to include the other two individuals in the initial training session. The scorecard is a good tool to coordinate the EE and work components of YCC, but to be successful those responsible for the overall summer program must support the use of the scorecard and make inputs to its content.

A program description for spring training might read as follows:

(1) Introduction of behavioral objectives. 1-1½ hours.
This session should not be simply a lecture; participants should be given an opportunity to practice making discriminations between program descriptions and behavioral objectives. In addition they should practice writing behavioral objectives and having the written products critiqued.

(2) Teams composed of the representatives from each camp write a set of behavioral objectives for a portion of the EE program.
A good exercise would entail having a camp team write educational objectives associated with a particular work project. This would model an important goal of the EE program--that of integrating EE with work. Another exercise would entail writing behavioral objectives for an educational goal that did not arise out of a specific work project. Do not move to the next phase of the training until the leader of this training session is convinced that the participants are capable of writing high quality behavioral objectives.

(3) Introduction to the remainder of the scorecard program (individual scorecards, staff certification, summary records, etc.).
In addition to this basic training, it is recommended that time be set aside for staffs to continue the process of writing behavioral objectives for their own program. This will allow the time and opportunity for the training staff to critique the objectives generated for any of the participating camps. This can be immensely helpful in a program that is as decentralized as the present Youth Conservation Corps program.

An educational tool that would be helpful for this training is a set of behavioral objectives which describe what the trainers' goals are for each participant. It could be presented in the format of an EE scorecard. An example appears in the appendix. Another helpful tool could be developed by the training team. This is a short programmed text on how to write behavioral objectives, with all of the examples based on YCC experiences.

Pre-camp training week. It is recommended that the staff training program in each camp include at least one day during which the EE instructor works together with the rest of the staff to hammer out the final version of the scorecard. To the directors of some camps this may seem like an inordinant amount of time to be spending on environmental education issues, especially when many other things may need to be done in order to prepare for the impending arrival of enrollees. However, this activity of generating and critiquing behavioral objectives for the EE program can be key to the organization and flow of the entire summer program. The scorecard is more than just an ancillary tool for evaluation purposes; it can guide the development of the staff approach to teaching and, more generally, to interacting with YCC enrollees.

In most camp situations it is not practical or even desirable that the entire staff generate all of the behavioral objectives from scratch. Indeed, it is rare that staff members other than the EEI would feel capable to describe an entire EE program. Accordingly, it is recommended that the EE instructor generate a first draft of the behavioral objectives for the camp, and present this draft to the staff during the training week. The task for the staff is to talk among themselves and critique the objectives. This activity requires considerable time, especially as various staff members find out that their views of the education program differ from that of others on the staff. The staff is likely to make only minor changes in the objectives that are presented to them. Even so, whatever changes are suggested come after much discussion about what the EE program is all about, and the discussion will make them much more effective as teachers.

In a situation where a large number of the staff have extensive background in environmental education, the EEI may chose to specify much less of the program than suggested above. He might provide only a skeleton of the EE program and have the rest of the staff generate all of the specific behavioral objectives. An EEI who chooses this route should be aware that a great amount of time can be consumed in trying to construct a set of behavioral objectives which is extensive enough for an entire summer's program.

EEIs should be warned to expect great resistance to the idea of writing a set of behavioral objectives for the EE program. This resistance will arise because of a misconception that most people have about the nature of behavioral objectives. It is frequently thought that behavioral objectives restrict an educational program by focusing on facts and memorization. The following examples of resistance were identified in the experiment conducted during the summer of 1975. (These resistances all faded away after the staff had additional experience with the scorecard program.)

--"Name," "describe," "cite," "list" are all activities related to the regurgitation of facts. Thus, behavioral objectives do not allow for problem-solving and appreciation types of activities; behavioral objectives are too limited for our needs.

--The scorecard requires that we specify ahead of time too much detail about the educational program. This will kill the spontaneity of our program.

--The scorecard approach is too structured. It is too much like school and the kids and staff both want to get away from the school type of approach.

Many of these objections cannot be dealt with directly by words of encouragement from the EEI. Most staff will simply have to wait to experience how a scorecard program works before they will become "believers." There are two things which an EEI can do, however, to meet some of this initial criticism. First is to cite success of the scorecard approach in the four experimental camps of the summer of 1975. Second is to direct the staff to the sample scorecards developed in the summer of 1975; they illustrate the variety of EE activities which can be incorporated into a scorecard. There are even a few examples of "appreciation" objectives and skill development objectives (e.g., photography).

Enrollee involvement. In some camps the question will be raised about involving enrollees in the writing of behavioral objectives. It is the author's feeling that it is impractical to involve enrollees in this activity. There are several things to recommend against it. Enrollees usually are unfamiliar with the territory and with the types of activities in which they will be engaged for the summer. Enrollees are also unlikely to have the skills to specify their own educational program, especially in an area as new as environmental education. Finally, time is too short in a four to eight week program to expect that great chunks of time can be devoted to having enrollees think through what it is they want or should be learning. However, we are committed to the general principle of enrollee involvement wherever it is reasonable. Thus, we could see value in having campers do something like the following. A sub-group of enrollees might be asked to write the educational objectives for the very last work project of the season. If the particular project were well enough specified, it would be a learning activity for the enrollees to figure out what it is they could learn from the activity. For example, what are the possible ecological learnings to be gotten from transplanting marsh grass, live-trapping and moving a beaver family, building a trail-side rest area, or re-stocking a small brook? A second way in which enrollees might be involved would entail their critiquing at the end of the season the set of objectives which were followed for that season. Many enrollees may have suggestions for improving the objectives for a coming season. In the process of carrying out the critique, enrollees would have a chance to synthesize and summarize their own learnings of the summer.

WHAT THE CORE OBJECTIVES SHOULD SAY

Most of the scorecards which were developed in the summer of 1975 included only objectives for the "core" EE program. They were considered core because it was expected that all of the enrollees would achieve them. In one camp, a set of optional objectives was specified in addition to the core; an enrollee could choose to fulfill any or none of the optional objectives. In addition to objectives which describe environmental learning outcomes, it is quite possible for a section of the scorecard to be set aside for personal objectives. This could include such objectives as learning how to use tools, survive in the wilderness, prepare for a camping trip, handle a canoe, etc. Such objectives which are not part of the EE program could be required of all enrollees, or could be optional. The recommendations in this particular report considers only the core objectives for the environmental education program.

In keeping with the general philosophy of the YCC program, the core objectives should be those which are achievable by all enrollees. This means that the final set of objectives for the camp should be a set which the staff thinks can be reached by all of the enrollees by the end of the session. If this indeed happens, then all enrollees will be insured of having a success experience in YCC.

This is not a trivial point. Whether by design or default, most public school instruction is characterized by spreading out students on a continuum of achievement, so that students are always aware of their ability in a particular subject relative to classmates. If the objectives in the scorecard are indeed achievable by all, then the YCC education program will be different from what the enrollees experience during the school year, and indeed be evaluated by them as a superior educational experience. Based on the 1975 Experiment, a set of objectives which are achievable by all enrollees will still represent a very impressive program (see the sample scorecards). This is partly true because so much more can be learned in the outdoor action-oriented "classroom" of a YCC camp.

A guide to the content. The core objectives for each camp's program will be similar to those of other camps and yet quite different. They will be similar in that all camps should follow the guidelines which were developed by the Environmental Awareness Task Force in the late summer of 1975. These appear in the *YCC Environmental Awareness Source Book--1976*. However, guidelines are just that; a listing of topic areas which each camp should cover in its own unique way. The specific behavioral objectives take into account the unique resources available in each camp.

As noted in the previous section, a common image of the nature of the behavioral objectives is that they cover only "regurgitative" types of activities. Thus, people tend to think that behavioral objectives are only of the following form:

Example 1: Identify 20 species of plants in the camp area.

Example 2: List four characteristics of each soil found from lake edge to upland meadow.

Such objectives test for mastery of facts and indeed may be a necessary part of any environmental education program. However, many people are concerned that this is the only type of behavioral objective that exists, and since they do not want their program to be a "memorizing the facts" type of program, they reject behavioral objectives out of hand. It is our experience that two things are involved. One, staff need to realize that other types of objectives that involve integration, problem-solving, and affective outcomes are indeed possible. Two, once this realization is made, a staff will usually recognize that there is a certain knowledge base that is required before students can work at the problem-solving level. A helpful experience for a staff to have is to conduct a problem-solving activity such as, "How could the land here be used differently in a way which would be ecologically more sound?" Intelligent discussions on topics such as these require the acquisition of some basic facts about soil compaction, waste decomposition, and other related topics before reasonable suggestions can be made about sound ecological use.

Many examples of imaginative types of behavioral objectives can be found by looking at the sample scorecards in the appendix; a few illustrations will be considered here. Objectives can be written which specify the major outcomes associated with an activity. For example:

Example 3: Perform a water analysis using the Hach water analysis kit. Do readings on dissolved oxygen, Ph, and temperature. List three ways in which man can affect each of the above elements in water.

This objective specifies an activity which all enrollees are to carry out. It also makes it quite clear to both staff and enrollees alike that there is no expectation that an enrollee should become a water scientist. There are only three readings which will be required of an enrollee, thus it is clear from the beginning that the expectations are quite reasonable for any teenager to achieve. The final part of the objective, asking for ways in which man can affect water, is the type of objective which results from a staff interacting about the purpose of an activity such as water analysis. It is clear for all to see that a water analysis is to be carried out because it teaches something about man and his relationship to the environment.

A fourth example shows how a behavioral objective can incorporate problem-solving.

Example 4: Identify, analyze and propose at least two alternate plans of management for each of your work projects.

This objective requires a high level of creative thinking and problem-solving to be successfully completed. It is also quite clear that the objective would meet an overall goal of the EE program: getting teenagers to appreciate the impact which man has had and can have on the environment.

A final example is presented which attempts to get at the emotional side of environmental education. By the admission of its creator the wording is not perfect; however, it is an attempt to make explicit the feeling side of the EE goals.

Example 5: On a nature hike show a recognition (using all your senses) of the presence of natural phenomena of which you were formerly unaware. The goal is not to be able to name the many features of the environment; rather to simply recognize the existence of the not-so-obvious workings of the environment. Examples: (a) walking barefoot on a bog, recognizing that there are many different-feeling plants underfoot and that the bog itself feels different from solid ground; (b) hear that there are many different noises in the woods; (c) notice different smells in the woods.

This last example is presented to encourage camp staffs to push the limits of behavioral objectives to get at some of the very elusive and hard-to-express goals which the staff may have for enrollees.

On the next page is shown a list of verbs which were used in the 1975 experiment. These were culled from the four scorecards which were developed during this experiment. They are divided into five different categories to illustrate the different "levels" which an objective can have, depending on the type of outcome which is being specified. The lowest level verbs describe a behavior in which the learner demonstrates merely that he or she has acquired a certain amount of information. The second level is higher in that the learner is asked to do some synthesizing or problem-solving using facts. While the higher level are frequently looked on as being more desirable, most of the higher level types of activities require the mastery of information as a prior step. Another type of behavior specifies that an activity is to be carried out such as collecting something or performing some packaged analysis such as a soil or water analysis. The implication here is that various types of learning are required for the activity to be carried out successfully, but not all of them are specified. Thus, to perform a soil analysis requires elementary laboratory skills and basic scientific investigation skills. The final category of objectives are those which concern affective or emotional outcomes. These are the ones that are most difficult to specify but which it is felt the staff should spend a lot of effort trying to develop. It is this author's

TYPES OF BEHAVIORAL OBJECTIVES
USED IN YCC SCORECARD EXPERIMENT, SUMMER 1975
(Numbers in parentheses are the number of objectives of this type in the four experimental camps)

THINKING/REASONING BEHAVIORS

(99) 1. *Lowest level, demonstrating acquisition of information:* identify (21), describe (37), define (15), recite (13), name or indicate (5), list (8).

(44) 2a. *Higher level requiring some synthesis or problem-solving:* analyze (4), explain (9), compare (2), propose and defend a solution to a problem (4), discuss (4), share views (1), correlate (1), predict (2), estimate (1), interpret (1), plan an activity (1), relate (1), cite an example (13).

(6) 2b. *Higher level requiring some synthesis or problem-solving AND resulting in a visible product:* develop a dichotomous key (1), write an essay (2), take and record readings (1), add information to a chart (1), record results (1).

ACTIVITIES

(28) 3. *These have a thinking component but the emphasis is on the action:* collect (5), locate (2), do a soil or water analysis (4), conduct a visual examination (1), live-trap beaver (1), construct [a stream sampling screen, nesting box, etc.] (4), take pictures (1), set compass bearings (1), send a water sample to state lab requesting an analysis (1), view films (1), attend seminar (1), measure the site index of a northern hardwood (1), spend time in an activity (1), make bread or grind flour (1), measure (3), lead a seminar.

AFFECTIVE OR EMOTIONAL

(5) 4. work cooperatively (1), show a recognition of the presence of natural phenomena (1), analyze your life style (2), communicate your feelings (1).

[It is not necessary that a camp have specific affective objectives. It is reasonable to assume that attitude formation comes indirectly as a result of participating in all the other activities.]

observation that many staff involved in YCC bring to their job an almost religious zeal in their concern for ecological issues. They might feel a deep love and respect for the non-human elements in the ecosystem, or a sense of indignation over man's abuse of the natural resources. Their hope is that enrollees will come away from their YCC experience with a similar emotional intensity. But they perform a disservice for themselves and the enrollees if they do not think through carefully the specific enrollee outcomes which they hope for. Most adults acquire feelings such as these over a long period of time. A lifelong love and respect for non-human creatures may begin with one single observation by an enrollee that human territorial expansion is depriving some creatures of their natural habitat. The future leader of an urban ecology club may begin developing her concern for the earth's non-renewable resources by having to look up and recite some facts about annual oil use and the estimated reserves available for future generations. Eight weeks is too short to "convert" a youth, but it is ample time to teach him some facts and skills, and expose him to new experiences and viewpoints.

Using the "Environmental Awareness Guidelines": The camp staff responsible for the scorecard should begin their job by reading the 1976 Environmental Awareness Guidelines printed in the *Source Book*. In the course of reading these several things will come to mind. One, the guidelines will suggest specific behavioral objectives which are not related to work projects. Two, they will suggest certain types of projects which are particularly suitable to illustrating some specific guideline. As the project is analyzed for its specific educational components, it will frequently occur that objectives are suggested which go beyond the guidelines, but which will become part of a camp's program because they are appropriate learnings within the overall goals of the EE program.

An easy way to begin involving an entire camp staff in the generation of behavioral objectives is to have them analyze the summer's work projects for their educational components. This provides some initial structure for the activity, and it also will start the staff thinking about ways in which the work might be carried out to best exploit the educational potential.

Camps may find it helpful to organize their entire scorecard around the work projects. This has the advantage that the scorecard can serve not only as an educational guide, but also as an organizing tool for the work program. An example of this type of organization is illustrated in the scorecard from Seney Wildlife Refuge, which appears in the appendix of this report. Recreation activities can be included as well, if they have a specific educational component.

A CHART TO MATCH EACH CAMP'S OBJECTIVES WITH THE NATIONAL GUIDELINES

To help assess the degree to which a camp's scorecard of objectives meets the guidelines set down by Washington for EE programs, it is suggested that something be added to the scorecard program which was not part of the

1975 experiment. This is a simple chart in which the rows are the objectives in the camp and the columns are the major guidelines for the program. An EEI would check off for each objective the guidelines which the objective was designed to meet. An example of such a chart is shown below. Note that by summing the columns, the EEI can see immediately

Example of a form on which each camp would report the match between their behavioral objectives and the broader goals and objectives stated in the national guidelines

MATCHING THE CAMP SCORECARD
WITH THE NATIONAL GUIDELINES

Instructions: In the left-hand column enter the number for each behavioral objective on your scorecard. For each behavioral objective place an "x" under the guideline objective which it is designed to satisfy.

Total behavioral objectives per goal →		8							
Column totals →		2	3	1	2	0			
		GUIDELINE GOALS/OBJECTIVES							
		1.1	1.2	1.3	1.4	1.5	2.1	2.2	2.3.....5.3
BEHAVIORAL OBJECTIVES FROM CAMP SCORECARD	1	x							
	2a		x		x				
	2b		x	x					
	3				x				
	4	x	x						
	.								
	.								
	.								
	.								

if there are behavioral objectives written for each of the major guideline areas in the EE program. This is the criterion which both the EEI and the region (or Washington) should use to assess the adequacy of the camp program. This chart along with the actual scorecard should be sufficient to assess whether the guidelines were properly implemented in each and every camp throughout the country. (Achievement of the objectives in the scorecard is discussed later.)

INDIVIDUAL ENROLLEE SCORECARDS

The set of educational objectives should be entered into a scorecard which can be printed or duplicated and distributed to everyone in camp. The scorecard consists of (1) a place for the camper's name, (2) a listing of the objectives and (3) a place provided next to each objective for a staff person to enter his initials and the date when the objective was accomplished. Each enrollee and each staff person needs to have a copy of the scorecard. Since the final list of objectives may be decided upon only days before the beginning of camp, a local printer should be enlisted well in advance to provide rapid turnaround.

In the 1975 experiment, there were two certification columns on the scorecard. One column was used for certifying the achievement of an objective during camp, the other for certifying the achievement of an objective prior to the beginning of the camp's educational program. While this "double checking" is desirable from a theoretical standpoint of evaluating how much the camp education program teaches, it is impractical. In subsequent years, it seems reasonable to include only the one column which certifies achievement of objectives during the camp season.

INTRODUCING THE SCORECARD TO ENROLLEES

A camp staff has some latitude concerning when the actual scorecard is introduced to enrollees. Some camps report that at the very beginning of the camp season anything such as a test or scorecard is seen as a negative aspect of YCC. Teenagers come to camp tired of school, and reject any reminders of the long school year behind them. In such a situation, it seems quite reasonable to hold off the introduction of the actual scorecard for as much as one week (in an eight-week program) into the season. Such a delay can be helpful only if the following strategy is followed. The camp staff operates the education program as it is specified in the scorecard. The only difference is that the enrollees are not told that a definite educational program is being followed. When the scorecard is introduced, it is pointed out to enrollees that at this point in time they have already achieved a large number of the objectives that the staff had set for the EE program. In this way, slow learners and those who are apt to feel most negative about a school-like education program will receive a boost when they realize that in the course of a very short time they have already achieved a large number of objectives.

At the time the scorecard is presented to the camp it is important that the staff be fully in support of the scorecard. Enrollees will sense if this is not the case. If the staff see the scorecard as helpful and convey this to the enrollees, they will respond accordingly.

SCORING PROCEDURES

Certification of the achievement of objectives should be the responsibility of the staff. In some camps it may be felt that only the EEI should be allowed to initial the achievement of an objective. However, this may be unduly restrictive, and present an unneeded burden on a single staff person. The key factor to be considered is that whatever group of staff is responsible for certification, they should all share the same criterion for what represents "achievement" of any one objective. Enrollees should not sense that one staff person is "easy" and another staff person "hard." What exactly is required for achievement of any one objective is not always easily specified. Objectives that require listing, citing, or defining are easy to judge because the criteria are commonly held by all. However, other objectives require the judgment of the certifier. These objectives should be discussed in detail among the staff. The most important thing is consistency, and making sure that the requirements are adequate to the intent of the behavioral objective. The system can be easily manipulated to make a camp "look good," but such manipulation will not be helpful to other enrollees or the staff in terms of having a quality environmental education program.

An issue to be discussed among the staff relates to how many enrollees can be certified at any one time. Some objectives state clearly that an enrollee is to do a particular activity and report on the results of the activity performed. For example, doing a soil analysis requires that each enrollee take a sample of soil and identify a specified number of components of that soil. Presumably, each enrollee must be certified separately as to the achievement of such an objective. Other objectives require the enrollee to perform activities such as to discuss, propose a solution to a problem, compare two uses of land, or other activities which might reasonably be carried on in a group setting. The question is whether the staff will allow mere participation in a discussion to result in the certification of all people who belong to the discussion group. There is no simple answer to this question. The staff must decide separately for each objective, taking into consideration the educational goals which they have for the enrollees. If the goal for the particular objective is to have each enrollee take home a specific skill, then it is probably necessary to separately certify each enrollee on the attainment of that objective. If the educational goal is to merely expose enrollees to some new ideas, concepts, or activities, then certifying all who participate in the activity--regardless of the extent of their participation--is probably an acceptable practice. During staff training week, after the scorecard content has been finalized, the staff should be led in a discussion of the norms for certification, and asked which, if

any, of the objectives the staff thinks could be approved in a group setting. Since the answer is not easy for anyone to make in the abstract prior to teaching enrollees in the field, this same discussion should be repeated after the first week or two of camp.

MASTER SCORECARD

It is recommended that a master scorecard be kept on which the progress of each enrollee is charted. If this master scorecard is updated once a week or more frequently, the EEI can see at a glance whether or not there are particular enrollees or particular work groups which are falling behind the planned progress of the program. Thus, the master scorecard can tell an EEI where to place a corrective prod.

In the experimental year it was recommended that a master scorecard be posted publicly in camp so that enrollees and staff could keep track of progress. In three of the four camps it was decided by the staff that they would not post the scorecard publicly. The rationale was that such a posting would engender unhealthy competition among the enrollees. It is the author's belief that the public posting of a scorecard does not necessarily instill unhealthy competition. However, is is not obvious that public posting has any intrinsic advantages and accordingly it should not be done unless the camp staff feels it will help their program.

MASTER SCORECARD SUMMARY FORM

During camp the master scorecard can provide continuous diagnostic information on the progress of the educational program. At the end of camp it can supply information on the overall success of the program. This diagnostic information comes from summarizing the master scorecard results. Each objective should be scored by tallying the number of enrollees who achieve the objective and dividing by the total number of enrollees. This figure answers the question, "What percentage of the enrollees achieved objective X?" These numbers might be transferred to an individual scorecard; the scorecard can then be scanned to identify objectives where the achievement level is below what was hoped for. This diagnostic exercise is very important. A staff writes a collection of behavioral objectives, hoping that they will all be achieved by all enrollees. The staff ought to be interested in whether or not their goal was achieved in the course of the summer. Falling short of the goal should result in revision of the program for the coming year; perhaps certain objectives should be dropped which are seen in retrospect as being too time consuming. The achievement of an objective by only a small portion of enrollees may suggest that it is too difficult to be part of the "core." One hundred percent achievement of all objectives might be an indicator of a perfect program, or it might lead the staff to raise the question of whether the program in a subsequent year might not be expanded to include even more objectives. Whatever the conclusion, the point is that a master scorecard requires very little work to maintain and yet can provide a lot of information which is helpful in revising an EE program to make the best possible program for youth. The conclusions

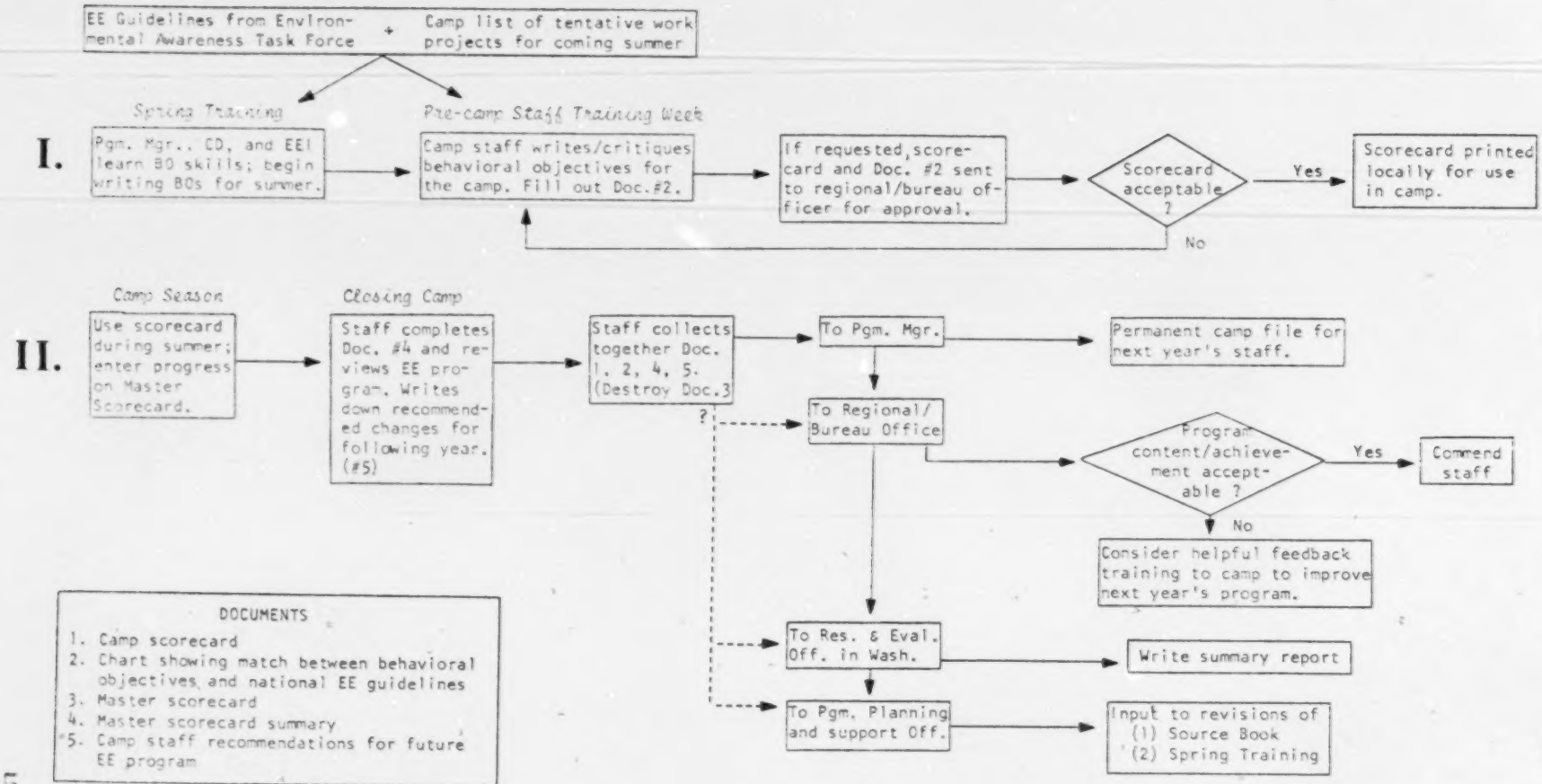
reached by the staff should be committed to writing at the time the diagnosis is made. Any notes for the revision of the scorecard should be included in this document and kept by the Program Manager--in case there are key personnel changes the following summer.

Another purpose of the master scorecard summary is to provide some information to those outside the individual camps who are responsible for the overall program. While it is recognized that the scorecard is not a perfect evaluation tool in terms of it being an objective measure of what it is that YCC enrollees learn, the mere list of objectives gives some indication of the quality of each camp's EE program. People at various levels might be interested in this information. First are the regional or bureau people who feel a direct line responsbility for the performance of these camps. The scorecard is a good discussion tool for camp staff to convey to these people both the content and relative success of the Environmental Education Program. The fact that it can be "scored" at camp means that the summary data are ready for use within a few days of the end of camp. A second group interested in the scorecard results are at the Washington level. Those responsible for program evaluation can use the results in compiling the annual program report. Each scorecard is an example of the kinds of things that are being taught in the field and may indeed be more impressive to Congressmen and others concerned with the continuation of the YCC program than any objective test of environmental knowledge. Finally, the "matching" document and the summary data on completion of objectives provide helpful information for those in program planning and support. These provide key data for revision of the *Source Book* and the curriculum for spring training of camp staff.

OVERVIEW OF THE SCORECARD PROGRAM

We present below a flow chart of activities involved in establishing a scorecard program in the YCC camps. There are several unresolved issues in this flow chart. Note first that the third box indicates that the draft scorecard is to be sent to the regional or bureau officer for approval. It is essential that a decision be made at some point about whether or not a camp's set of behavioral objectives indeed meets the goals set out in the EE guidelines. It is felt by this author that the assessment of whether or not the objectives are acceptable should be made somewhere outside of the camp, most likely by a regional officer, but perhaps as high as Washington. If it was done at the regional level, the task would be quite manageable. It is reasonable to assume that turnaround time would be quick enough to satisfy the demands of having a scorecard printed before the end of the first week of camp. If it was done at the Washington level, the task would be much more difficult, and the turnaround time perhaps intolerably long. What is the rationale for this outside certification? Inasmuch as the Washington office of YCC wishes to say to Congress that there is a core of learnings to which all enrollees have an opportunity to be exposed, then Washington must certify that this indeed occurs in the program. The only way this can happen is if Washington monitors in some way the content of the program in each camp. It should be noted that it is in the nature of

THE ENVIRONMENTAL LEARNINGS SCORECARD:
FLOW CHART FOR IMPLEMENTING THE BEHAVIORAL OBJECTIVES (BO) APPROACH


EE Guidelines from Environmental Awareness Task Force
+
Camp list of tentative work projects for coming summer
I.
Spring Training
Pgm. Mgr., CD, and EEI learn BO skills; begin writing BOs for summer.
Pre-camp Staff Training Week
Camp staff writes/critiques behavioral objectives for the camp. Fill out Doc.#2.
If requested, scorecard and Doc. #2 sent to regional/bureau officer for approval.
Scorecard acceptable ?
Yes
Scorecard printed locally for use in camp.
No
II.
Camp Season
Use scorecard during summer; enter progress on Master Scorecard.
Closing Camp
Staff completes Doc. #4 and reviews EE program. Writes down recommended changes for following year. (#5)
Staff collects together Doc. 1, 2, 4, 5. (Destroy Doc.3
To Pgm. Mgr.
Permanent camp file for next year's staff.
To Regional/ Bureau Office
Program content/achievement acceptable ?
Yes
Commend staff
No
Consider helpful feedback training to camp to improve next year's program.
To Res. & Eval. Off. in Wash.
Write summary report
To Pgm. Planning and support Off.
Input to revisions of
(1) Source Book
(2) Spring Training
DOCUMENTS
1. Camp scorecard
2. Chart showing match between behavioral objectives and national EE guidelines
3. Master scorecard
4. Master scorecard summary
5. Camp staff recommendations for future EE program

the scorecard approach that great latitude is being provided to each camp to fulfill the guidelines in ways that are unique to the camp; so the approval process is not quite the same as having a unified national program which is constant from camp to camp.

A second issue in the diagram concerns the flow of information from the camp to people outside of the camp. In the diagram it shows the staff collecting together documents 1, 2, 4, and 5. (Note that it is recommended that document 3--the master scorecard--be destroyed. This is in keeping with the spirit of the Privacy Act.) These are forwarded to the program manager who places them in a permanent camp file and sends a copy of them to three other offices. To avoid lengthy delays of the material, the camp director or program manager might make the necessary number of copies and send them directly to each office.

The third issue concerns feedback on camp performance. It is proposed that whatever feedback is made on program content or achievement, that this feedback come from the responsible regional or bureau officer. The YCC program is becoming far too large for this kind of feedback to come from the Washington office. However, it is appropriate for Washington to decide on the general issue of whether or not intervention is going to be made in any camp's program where achievement of the objectives falls short of some internal standard. The decision must take into account that if there are penalties associated with failure, data on achievement of the objectives will be subject to manipulation by those responsible for reporting. An appropriate and non-threatening result of falling short of goals might be a consultation visit from an EE expert.

THE SCORECARD AS AN EVALUATION TOOL

How good is the scorecard as an evaluation tool? The answer requires asking yet another question: How good for whom? Let's consider the various users of data coming from the scorecard:

--enrollees
--camp staff
--regional/bureau staff
--national program, planning and support staff
--national program evaluation staff

The scorecard is ideal for individual enrollees as a device to help them monitor their own learnings. It is also good for those enrollees who are trying to secure high school credit for their YCC experience, because it summarizes the entire educational program. A copy of the enrollee's scorecard, signed by the EE instructor, should provide school personnel with sufficient information for their decision on granting credit.

With appropriate summarization of the data from all enrollees, the scorecard is a very good tool for camp staff to use in evaluating and modifying their educational program. It is especially helpful since all the scoring is done in camp, and thus there is not the long wait associated with machine-processing of the tests by a central office.

The needs of regional/bureau staff are twofold, and both of these are met by the scorecard summaries. These people need to evaluate individual camps and they need sometimes to conduct regional training sessions in which ideas are exchanged among four or five camps about the relative strengths of different EE programs. The scorecard summaries can be equally valuable for the national staff responsible for program, planning and support as they design the *Source Book* and Spring Training for the coming year. To be maximally useful, however, the national PP&S offices need to summarize the data differently. They will need to know such things as the frequency with which various types of objectives are used as input to modifying either the EE guidelines or the Spring Training curriculum.

The scorecard is weakest when it tries to fill the role of providing the traditional summative evaluation of the entire EE program. There are a number of reasons for this. Each camp is purposely being given great latitude in the way in which it will implement the national EE guidelines, therefore camps will vary in the content of their programs. The resulting lack of uniformity across camps makes it impossible to compare programs. There are at this time no criteria which can be used to equate the quality of different objectives. A second reason concerns the method of certification. Under the scorecard approach staff members make personal judgments of enrollee achievement, and there will be great variability in the standards used to determine whether an enrollee has reached the goal. This is a bad characteristic from the perspective of an evaluator who would like numbers which purport to measure in some objective way actual growth in knowledge, understanding and insight. However, in this author's judgement, the contribution which the scorecard can make to the improvement of the EE program in each camp outweighs the value which more quantitative measures of knowledge could provide. Past experience with a standardized test of environmental knowledge has shown the futility of this approach. It has become clear that the EE curriculum varies and will continue to vary greatly from camp to camp; thus, a standardized test is inappropriate by definition, since such a test assumes that all camps are trying to teach the same thing. In addition, leaving the testing in the hands of camp staff has resulted in manipulation of results by some camps to meet the pressure to appear good in the eyes of superiors. The solutions to these two problems would be to standardize the curriculum and to have the testing done by outside agencies. Neither of these solutions appear to have merit.

While the scorecard does not provide the comforting numbers of a testing program, the scorecards themselves, coupled with some minimal objectives-achieved data, represent some impressive qualitative information about the EE program. In some ways, the evidence they represent could be even more impressive to those in Congress and among the public who are looking for an intuitive understanding of what is being taught in the YCC program. Those responsible for evaluation at the national level can use the summary data and the scorecards to describe the program, and then describe to readers how evaluative decision-making is decentralized to the regional level and below. This strikes the author as a defensible (and even laudable) stance to take in a national program such as this.

Evaluation efforts in other national educational programs (Title I compensatory education, for example) have failed when they have tried to centralize control and testing. YCC could model a more viable approach to national programming with local control. They key to defending this approach would be describing the criteria which regional personnel use in their evaluations.

If it is decided to implement the behavioral objectives approach and the scorecard throughout the YCC program, the implementation will require several years in order to spread out the training for the many camps in the program. The question arises of whether or not to continue the Environmental Awareness Test for those camps which have not switched over their program to the scorecard. This author encourages a policy of eliminating the Environmental Awareness Test for all camps. However, the enrollee ratings questionnaire which is administered at the end of camp should be continued in all camps. Whether or not additional data should be collected from the camps to help in the process of evaluation should be decided upon in conjunction with the current review of information needs which is being carried on by the Youth Conservation Corps in conjunction with Dr. David Lingwood.

THE FUTURE OF TESTING IN YCC

Is there a future for testing in the YCC program? This depends on several things, foremost among which is whether there exists any administrative needs which might be filled by a testing program. There are two potential need areas: one is to answer the question of whether or not a YCC experience can have a measurable impact on adolescents; this is a question requiring basic research. The other need area concerns annual monitoring of whether or not the program is having an impact on youth each year; this is a question of continuous program evaluation. Let's consider these in turn.

YCC is currently a well-established program, looked upon favorably by legislators who are responsible for its continued financial support. However, its popularity could wane in coming years if the environmental movement loses popularity and new educational priorities arise which compete for allocation of scarce dollars. If such a time comes, the question will be asked: "exactly what impact does the YCC experience have on teenagers? Does eight weeks in an outdoor laboratory have any long-term effects on participants or the environment?" Those who have been associated with the program feel intuitively that YCC has a tremendous impact on an adolescent. Indeed, the research to date has supported this judgment, but the evidence has not been complete or incontrovertible. Looking forward to a time when the program might come under more careful scrutiny, a small-scale research program might be considered which would build on past research but go further in trying to pin down the exact nature of the impact of YCC on participants. The sample would include a small group of participants and a matched control

group of non-participants. Measurement might include systematic interviews of parents, peers, and teachers before and after a YCC summer. It could also include some form of testing to measure whether there is a difference between the two groups on knowledge (understanding concepts), physical skills (ability to handle tools, or ability to handle self in wilderness areas), or judgment skills (showing consideration for ecological principles in evaluating environmental problems).

The second potential administrative need is continuing program evaluation. It is the contention of this author that the scorecard should supply sufficient information on the EE program to satisfy both regional/bureau camp monitors and national program monitors. However, this is a matter of judgment. Potentially, the national staff could feel the need for more "hard" data to certify the continued soundness of the program from year to year. If this were the case, a number of possibilities could be considered short of a national testing program. First is the idea that in-depth measurement of camps could be done on a sampling basis, with only a fraction of the camps being evaluated annually. Second, the diversity of goals for YCC suggests that assessments of program quality might be best made by a visitation team, rather than by uniform testing in the camps. Whether or not testing can be used in these camps would depend on several issues to be raised below.

The existence of a testing program requires two things: educational goals for enrollees which are both uniform from camp to camp and measurable. In coming years it is possible to imagine certain goals becoming sufficiently central to the program that there is some agreement about specific concepts and skills to be taught. Already there has been considerable movement in this direction in the few short years of the program. Such concepts might include interdependence in the ecosystem and classification of natural resources into renewable and non-renewable categories. Among the physical skills might be ability to use certain kinds of tools; among the judgmental skills might be ability to recognize the ecological issues involved in certain environmental problems and the ability to choose environmentally sound solutions to these problems. Even if there is agreement on the centrality of these concepts, only some of the above educational goals can be measured by traditional paper-and-pencil multiple choice tests. Some require what has come to be known as "applied performance measures." For example, making ecologically sound judgments might best be measured by taking an enrollee to a test plot of soil on a steep slope and seeing how he would choose to plow the soil (coutour or not) and seeing which crop he chose to plant (short root vs. long root). This approach was used by Joseph Asch and Bruce Shore to evaluate an EE program in Canada. There are other variations on standard multiple choice tests which could be considered as well. One other issue concerns the purpose of the test. The kind of testing which is developed for a basic research program might be too long and cumbersome for use in program monitoring of all the enrollees.

Whatever the decision, if a need is felt for the kind of information that tests provide, it is imperative that time (1-2 years) and resources be set aside to develop the measurement tools and to do this prior to implementing the testing program. (in prior years annual test development refinement time ranged from 1-2 months.) The development of the scorecard is a good model in that it was piloted on a small scale prior to implementation on a large scale. A testing program would require even more lead time.

In sum, it is not clear that testing is needed in the YCC program; but if it is, considerable time and effort must be invested to develop a worthwhile program.

APPENDICES

-- 1975 Scorecards

-- 1975 Supporting forms

-- 1975 Training program materials

SAMPLE SCORECARD--
REDUCED SIZE FOR
EASY CARRYING

To achieve this size scorecard on legal size paper ($8\frac{1}{2}$" x 13").

1. Type original of scorecard on the original to 65%
   local printer: result in a new copy.
2. Instruct local printer: This will reduce each page of the original to 65% result in a new copy.
   a. photo reduce each page that is approximately $5\frac{1}{2}$" x $8\frac{1}{2}$".
   of its size. This will result in a new copy.
   of each page onto new sheets $8\frac{1}{2}$" x 11" following
   b. paste these onto new sheets $8\frac{1}{2}$" x 11" following
   layout of this sample scorecard. Produce enough
   c. print the result back-to-back. Produce enough in camp plus
   copies to have enough for everyone in camp plus
   a sizeable number of extras.

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD
CLEAR LAKE YCC -- SUMMER-1975

	Date and Staff Initials: Knew Before Camp	Learned At Camp
1. Do a soil analysis using the Lamotte soil sample kit and correctly identify the soil texture, structure, Ph, temperature, and color.	_____	_____
2. List ways in which man can affect each of the above elements of the soil.	_____	_____
3. Describe the differences between sand, silt, and clay.	_____	_____
4. Describe a plant community associated with common soil types in this area.	_____	_____
5. Name three animals associated with each of the above plant communities.	_____	_____
6. Describe the role of each of these elements in the hydrology cycle: evaporation, transpiration, rainfall, runoff, and ground water.	_____	_____
7. Describe in non-technical terms how plants make energy and oxygen as a by-product.	_____	_____
8. Cite 3 climatic factors which affect plant growth.	_____	_____
9. Cite 3 ways in which man alters forest and wetland ecosystems.	_____	_____
10. Describe at least 3 ways in which there is interaction among soil types, plant communities, and animals.	_____	_____
11. Correctly perform a water analysis using the Hach Water Analysis Kit. Do readings on dissolved oxygen, Ph, and temperature.	_____	_____
12. List 3 ways in which man can affect each of the above elements in water.	_____	_____

	Date and Staff Initials: Knew Before Camp	Learned At Camp
13. Construct a food chain from producers through consumers using plants and animals from this area. Note the numbers in each group relative to the adjacent group on the chain.		
14. Describe the flow of energy from the sun through the food chain.		
15. Given several plant or animal populations, identify 3 factors which could limit the number of individuals in that population.		
16. Indicate what evidence would indicate that there was too large an animal population on a plant community.		
17. Given three areas in different stages of succession, identify which stage each area is in and support your decision.		
18. Relate how productivity varies in each stage from pioneer to intermediate to climax.		
19. Indicate ways in which man can influence plant success.		
20. After study visits to the following, communicate your attitudes and feelings about man's effect on ecosystems in this area. (a) sanitary land fill, (b) solid waste disposal, (c) an industrial site, (d) recreational areas, (e) forest management areas, (f) residential areas around a lake.		
21. Outline the Forest Service philosophy of multiple land use.		
22. Identify, analyze and propose at least two alternate plans of management for each of your work projects that has a management dimension to it.		
23. At the end of the summer participate in a discussion which attempts to identify ecological problems that exist in your home setting and suggest possible solutions to some of them.		

	Date and Staff Initials: Knew Before Camp	Learned At Camp
24. Analyze your life style (pattern of recreation, consumption, transportation, shelter, job) with respect to the following: (a) its impact on other people, (b) whether resources involved are renewable or non-renewable, (c) whether or not the products are biodegradable, (d) whether activity is based on need or want, (e) whether activity shows concern for present or future, (f) whether activity shows concern for forms of life other than man.		
25. Participate in the planning and carrying out of the following activities: (a) overnight backpacking (edible foods, etc.), (b) day hiking (map reading, rock scrambling, etc.), (c) river canoeing.		
26. On the above activities work cooperatively to achieve the objectives of the activities.		
27. Demonstrate in your own decision-making an awareness that every action has more than one impact; that the action makes "ripples" throughout the ecosystem.		
28. On a nature hike show a recognition (using all your senses) of the presence of natural phenomena of which you were formerly unaware. The goal is not to be able to name the many features of the environment; rather to simply recognize the existence of the not-so-obvious workings of the environment. Examples: (a) walking barefoot on a bog, recognizing that there are many different-feeling plants underfoot and that the bog itself feels different from solid ground. (b) Hear that there are many different noises in the woods. (c) Notice different smells in the woods.		
29. In 5 years, given a decision that will have an impact on the environment, choose the alternative that shows the greatest respect for the delicate nature of the environment.		

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD
CLEAR LAKE YCC -- SUMMER 1975

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
1. Do a soil analysis using the Lamotte soil sample kit and correctly identify the soil texture, structure, Ph, temperature, and color.	_____	_____
2. List ways in which man can affect each of the above elements of the soil.	_____	_____
3. Describe the differences between sand, silt, and clay.	_____	_____
4. Describe a plant community associated with common soil types in this area.	_____	_____
5. Name three animals associated with each of the above plant communities.	_____	_____
6. Describe the role of each of these elements in the hydrology cycle: evaporation, transpiration, rainfall, runoff, and ground water.	_____	_____
7. Describe in non-technical terms how plants make energy and oxygen as a by-product.	_____	_____
8. Cite 3 climatic factors which affect plant growth.	_____	_____
9. Cite 3 ways in which man alters forest and wetland ecosystems.	_____	_____
10. Describe at least 3 ways in which there is interaction among soil types, plant communities, and animals.	_____	_____
11. Correctly perform a water analysis using the Hach Water Analysis Kit. Do readings on dissolved oxygen, Ph, and temperature.	_____	_____
12. List 3 ways in which man can affect each of the above elements in water.	_____	_____
13. Construct a food chain from producers through consumers using plants and animals from this area. Note the numbers in each group relative to the adjacent group on the chain.	_____	_____
14. Describe the flow of energy from the sun through the food chain.	_____	_____
15. Given several plant or animal populations, identify 3 factors which could limit the number of individuals in that population.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
16. Indicate what evidence would indicate that there was too large an animal population on a plant community.	_____	_____
17. Given three areas in different stages of succession, identify which stage each area is in and support your decision.	_____	_____
18. Relate how productivity varies in each stage from pioneer to intermediate to climax.	_____	_____
19. Indicate ways in which man can influence plant success.	_____	_____
20. After study visits to the following, communicate your attitudes and feelings about man's effect on ecosystems in this area. (a) sanitary land fill, (b) solid waste disposal, (c) an industrial site, (d) recreational areas, (e) forest management areas, (f) residential areas around a lake.	_____	_____
21. Outline the Forest Service philosophy of multiple land use.	_____	_____
22. Identify, analyze and propose at least two alternate plans of management for each of your work projects that has a management dimension to it.	_____	_____
23. At the end of the summer participate in a discussion which attempts to identify ecological problems that exist in your home setting and suggest possible solutions to some of them.	_____	_____
24. Analyze your life style (pattern of recreation, consumption, transportation, shelter, job) with respect to the following: (a) its impact on other people, (b) whether resources involved are renewable or non-renewable, (c) whether or not the products are biodegradable, (d) whether activity is based on need or want, (e) whether activity shows concern for present or future, (f) whether activity shows concern for forms of life other than man.	_____	_____
25. Participate in the planning and carrying out of the following activities: (a) overnight backpacking (edible foods, etc.), (b) day hiking (map reading, rock scrambling, etc.), (c) river canoeing.	_____	_____
26. On the above activities work cooperatively to achieve the objectives of the activities.	_____	_____
27. Demonstrate in your own decision-making an awareness that every action has more than one impact; that the action makes "ripples" throughout the ecosystem.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
28. On a nature hike show a recognition (using all your senses) of the presence of natural phenomena of which you were formerly unaware. The goal is not to be able to name the many features of the environment; rather to simply recognize the existence of the not-so-obvious workings of the environment. Example: (a) walking barefoot on a bog, recognizing that there are many different feeling plants underfoot and that the bog itself feels different from solid ground. (b) Hear that there are many different noises in the woods. (c) Notice different smells in the woods.	_____	_____
29. In 5 years, given a decision that will have an impact on the environment, choose the alternative that shows the greatest respect for the delicate nature of the environment.		

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD
MT. RAINIER YCC -- SUMMER 1975

UNDERSTANDING KEY TERMS

Define term in your own words to the satisfaction of staff.
Recite the "key phrase" for the term.
Cite one example of the term from each of four environments: (i) natural environment inside Park; (ii) natural environment outside Park; (iii) urban physical environment; (iv) human social environment.

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
1. INTERDEPENDENCE		
a. Define term and recite "key phrase."	_____	_____
b. Using 3 examples, describe the relationship between man and trees or animals.	_____	_____
c. Using 3 examples, describe the relationship between YCC enrollees and Park Service employees.	_____	_____
d. Describe at least 3 ways in which the natural environment and Washington State's economy are interrelated and interdependent.	_____	_____
e. Describe at least 3 ways in which a lumber mill is related to a supermarket.	_____	_____
f. Describe at least 3 ways in which Rainier, the mountain, is interrelated with the surrounding natural and man-made environments.	_____	_____
g. Describe 3 ways in which Mt. Rainier National Park is interrelated with the natural and man-made environments outside the Park.	_____	_____
2. DIVERSITY		
a. Define term and recite "key phrase."	_____	_____
b. Develop a dichotomous key for leaves from 10 different trees.	_____	_____
c. Describe a large urban environment in terms of the types of diversity found there (living patterns, people, work environment, businesses, functional areas such as living and working, etc.	_____	_____
d. Choose 3 different cities which have different images or character and describe what the image or character is.		

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
e. People often have a wide variety of feelings related to a single experience. Describe five feelings which you experienced during a recent work project.	_____	_____
f. Describe 3 different human needs that are met by the Mountain (Rainier).	_____	_____
3. CHANGE		
a. Define term and recite "key phrase."	_____	_____
b. List 5 changes that have taken place at a recent work project site (both physical and ecological changes).	_____	_____
c. Describe 5 changes that have taken place in you since you arrived at YCC.	_____	_____
d. Using 5 words for each, describe Longmire 100 years ago, today, and 100 years in the future.	_____	_____
e. Describe 5 ways in which water in its many forms is causing changes in Mt. Rainier.	_____	_____
4. Community. Define, recite, cite.	_____	_____
5. Niche. Define, recite, cite.	_____	_____
6. Habitat. Define, recite, cite.	_____	_____
7. Patterns. Define, recite, cite.	_____	_____
8. Carrying Capacity. Define, recite, cite.	_____	_____
9. Cycles. Define, recite, cite.	_____	_____
10. Succession. Define, recite, cite.	_____	_____
11. Adaptation. Define, recite, cite.	_____	_____
12. Energy Flow. Define, recite, cite.	_____	_____
13. Evolution. Define, recite, cite.	_____	_____

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD
SENEY YCC -- SUMMER 1975

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
SOILS		
1. Using a soil sample kit: a. Correctly draw a sample of soil b. Identify the Ph, Nitrogen, Phosphorous and Potassium levels in the sample	_____	_____
2. Correlate flora with soil type, identifying two species that correspond to each part of the Ph range.	_____	_____
3. Explain what indicator species tell you about soil Ph in an area.	_____	_____
4. Define succession.	_____	_____
5. Define and distinguish among sand, silt, clay, humus.	_____	_____
6. As a part of a sedimentation study, determine the fractions of each soil type.	_____	_____
INVERTEBRATES IN WILDLIFE AREAS		
7. On visits to four different areas: a. Collect invertebrates in a "kill" jar b. Identify the characteristics of each invertebrate (body, legs, wings, and other obvious external features)	_____	_____
8. Develop a dichotomous key for the invertebrates.	_____	_____
9. Describe ways in which the invertebrates of each area are the same or different and give reasons for the difference.	_____	_____
DRIGGS RIVER VISIT		
10. a. Using a compass, determine the location of N, E, S, W.	_____	_____
b. Using the sun and physical features, get to the Driggs River from your starting point.	_____	_____
11. Select features of the area that the group agrees would be of interest to the public on a nature trip. Defend your choice.	_____	_____
12. Participate in a group discussion of the environmental impact of having a nature trail in the area.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
BIRD STUDY		
13. Identify the size, coloration and at least one distinctive feature (e.g., song, habit) of each bird on the special version of the listing "Birds of Seney Wildlife Refuge." (approximately 25 species)	_____	_____
14. Using the Field Guide to the Birds, locate the pictures of two birds in the Refuge, not including common birds such as the robin, blue jay, etc.	_____	_____
VISIT TO GRAND MARAIS DUNES		
15. Describe in your own words the origin of the Grand Marais Dunes.	_____	_____
16. Locate a poison ivy plant.	_____	_____
17. Describe in your own words the following things about the Lamprey Eel. a. How they invaded the Great Lakes b. Their effect on the fish on the Great Lakes c. How man is controlling the Lamprey	_____	_____
STREAM PROFILES		
18. Construct a "stream sampling screen" and a "range pole measuring device."	_____	_____
19. Conduct a visual examination of the stream bottom and draw a profile of the distribution of materials there.	_____	_____
20. Using the screen, collect material and debris from each section of the river bottom and record the results on the profile.	_____	_____
21. Take temperature readings of each of the main areas of the river bottom. Add data to the profile.	_____	_____
22. Collect and identify aquatic life from the river bottom and plant life from the adjacent river bank.	_____	_____
23. Using the range pole measuring device, determine the slope of several sections of the river. Add your findings to the profile.	_____	_____
FISH HATCHERY		
24. Participate in the field trip to the fish hatchery.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
WATER FOWL TRAPPING		
25. Observe and participate in the herding, banding, and examination (blood sampling and sexing) of geese in the Refuge.	_____	_____
BEAVER STUDY		
26. Within the Refuge, identify two areas which beavers would likely choose as their habitat based on vegetation and stream size.	_____	_____
27. Live-trap beaver in a given area and dismantle the dam and hut in the area. Be able to describe the structure and strength of the dam and hut. Give pros and cons of live trapping (man, beaver, sustained yield principles).	_____	_____
28. Identify at least 5 ways in which the presence of beavers and their buildings impacts on the surrounding area.	_____	_____
29. Based on all you have learned, suggest two possible relocation areas for the live-trapped beaver. Defend your choice, considering the impact on the environment (land and other animals).	_____	_____
NESTING BOXES		
30. Observe and participate in the checking of nesting boxes. Record your findings on the charts provided.	_____	_____
AQUATIC VEGETATION TRANSECT		
31. Plan and carry out an aquatic vegetation transect. a. Correctly set compass bearings b. Identify with the aid of handbooks, herbarium, and instructor guidance all of the collected vegetation	_____	_____
32. Identify without any assistance the dominant aquatic species in the Refuge (e.g., bullrush, cat-tail, American Lotus, etc.).	_____	_____
33. Construct a graph showing plant occurrence, plant density, and water depth, and likely bird species in the plant area. Graph must be of high enough quality to be entered into permanent files of the Refuge.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
WATER STUDY		
34. Using the Lamotte Water Testing Kit: a. Correctly identify which areas of a pond or stream need to be sampled b. From each sample, identify the levels of Ph, Nitrates, Phosphates, Silica, Calcium, Magnesium, hardness of the water, CO_2, and temperature c. Using your pocketbook (pp. 52-60), predict what aquatic life you would expect to find based on the Ph and temperature	_____	_____
35. Send part of one of your samples to the State Testing Laboratory. Compare their analysis with yours. Explain what a coloform count is and what it is used for. Explain public preference for hard/soft water and for water with low iron content.	_____	_____
SUMMARY		
36. At the end of camp write a description of the major goals of the Seney Refuge in the management of land and water for wildlife and in increasing public awareness. Explain how each of your work projects fits into one of these goals.	_____	_____

Camper's Name _____

ENVIRONMENTAL LEARNINGS SCORECARD
SPRINKLER LAKE YCC -- SUMMER 1975

Introduction

Of several hundred YCC camps in the United States, Sprinkler Lake is among four camps selected from all YCC to use an experimental system of measuring the nature and extent of environmental education. Instead of the traditional method of a written test, this new system uses a list of learning objectives that can be accomplished by most campers as well as a list which are optional and suggested additional learning activities.

The idea of this method of measurement was born when the testing method proved unsuccessful in measuring the learning that goes on in YCC camps. Since the Congress of the United States funds YCC, it is necessary for them to know the quality and extent of the environmental education programs. If this method of measurement proves successful, next year all YCC camps nationwide will use this system, and the Congress hopefully will find our results worthy of an even larger YCC program.

Prior to the beginning of camp, the Sprinkler Lake staff working together, wrote objectives they hoped every camper could successfully complete. These objectives are not intended to be restrictive, consequently we urge your creativity and initiative to write and accomplish your own objectives to meet your interests and needs.

These objectives should be looked upon as providing direction for both staff and camper. Our hope is that these objectives help make learning exciting and interesting. As you participate in a variety of exciting and meaningful experiences this summer to meet these objectives, we are convinced that you will be a changed and enriched person as well as an instrument for change to meet the environmental needs of the Space Ship Earth.

CORE OBJECTIVES -- FOR ALL CAMPERS

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
I. FOOD		
a. Describe the basic elements of human nutrition.	_____	_____
b. Discuss basic concepts of "protein complementing" in the preparation of complete foods from meatless ingredients.	_____	_____
c. View the films, "Where Food Comes From," and "Diet for a Small Planet."	_____	_____
d. Grind grains for flour to make bread and aid in the preparation of camp meals.	_____	_____
e. Spend 10 minutes per day in the camp garden, either weeding, transplanting, fertilizing, picking insects, mulching, etc. If you cannot bring yourself to work with the plants, then spend time sitting beside the garden thinking good thoughts.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned at Camp
f. Be responsible for own food waste by practicing in dining hall sorting the waste from meals. Read how each type of waste is disposed of. Waste types: glass, cans, organic, paper, plastic.	_____	_____
g. Participate in the composting process, helping to make a finished compost pile. Watch pile grow, noting which materials are necessary and in what order they are added.	_____	_____
2. WATER		
a. Explain the stages of succession a lake undergoes, using Sprinkler Lake as an example.	_____	_____
b. Given a map of the Sprinkler Lake Area, identify its watershed and drainage pattern.	_____	_____
c. Compare the plant and animal life of a lake with that of a stream and mention factors which explain how they differ.	_____	_____
d. Explain why it is important to use both biological and chemical criteria in determining water quality.	_____	_____
e. Determine the water quality of Sprinkler Lake using the Hach Testing Kit.	_____	_____
3. HUMAN IMPACT		
a. In a group analyze your own "lifestyle" with respect to the impact it has on the environment (people, non-humans, plant life, etc.) using the following criteria: (1) impact on other people; (2) whether resources used are renewable; (3) whether products used are biodegradable; (4) whether activity is based on need or want; (5) whether it shows concern for the present or the future; (6) whether it shows concern for forms of life other than man. Lifestyle includes: food consumption, transportation, types of recreation, clothes worn, house lived in, daily habits, how "waste" is dealt with.	_____	_____
b. Thinking ahead about environmental impacts: Given a series of choices where one alternative is clearly more "ecologically sound," make a choice and explain which alternative is most "sound." Identify five other areas in your daily life where you are faced with similar kinds of choices.	_____	_____
c. Identify a place on your work project where man has had an impact and tell whether it has been positive or negative. If less than fully positive, suggest changes in man's behavior which could improve the situation.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
d. Participate in crew discussion of population problems.	_____	_____
e. Through discussion with the staff and fellow campers, verbalize the extent and foundations of the environmental crisis.	_____	_____
f. Through discussion with staff members and fellow campers, cite specific factors that perpetuate a high rate of consumption and its effect upon the fragile living systems of the earth.	_____	_____
g. Discuss the uniquely human and highly destructive impact of industrial activity, and how it can be reduced.	_____	_____
4. SOIL INVESTIGATION		
a. Given a soil profile, define and identify the following: Texture, color, Ph, where found, use or potential, horizons, "critters."	_____	_____
b. List at least 10 plants found within 10 feet of the test site.	_____	_____
c. List 4 characteristics of each soil found from lake edge to upland meadow.	_____	_____
d. Discuss the relative productivity of this soil in comparison with three others.	_____	_____
e. Compare the relative water holding capacity of the "B" horizon with that of two other horizons.	_____	_____
f. Predict from the texture and slope of a soil its erodability.	_____	_____
g. Using the 6 soil characteristics, name the most limiting for: (1) road building, (2) campgrounds, (3) subdivision development, (4) hiking trails, (5) mineral extraction with surface rehabilitation.	_____	_____
5. BASIC ECOLOGY		
a. Describe the basic activities that take place in photosynthesis and respiration in plants and animals.	_____	_____
b. Describe with specific examples 2 food chains that are near the camp.	_____	_____
c. Explain how the extinction of a species can adversely affect a food web.	_____	_____
d. Using the concept of a food or energy pyramid, discuss the implications of living on a vegetarian diet vs. a meat diet.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
e. Describe the effect of 2 instances where a community has exceeded or is exceeding its carrying capacity.	_____	_____
f. Describe 5 examples of ecological succession visible around camp or surrounding area and be able to predict the future succession of the given communities.	_____	_____
g. Construct a list of at least 5 limiting factors and be able to describe how they interrelate to determine the habitat of a given site.	_____	_____
h. Be able to refer to at least 2 instances in the Sprinkler Lake area that show plant-animal interdependency. (e.g., ruffed grouse - aspen)	_____	_____

6. FIRE INVESTIGATIONS

Having participated in the fire investigations.

a. Analyze and list possible consequences of fire in a prescribed burn and a wild fire.	_____	_____
b. Describe the triangle theory and its relation to fire and fire suppression.	_____	_____
c. Identify and state the use of the major fire fighting equipment and tools.	_____	_____
d. List both the beneficial and harmful effects of fire on the resources.	_____	_____
e. Identify previous burned areas and identify pre-burned species.	_____	_____
f. Discuss two species of wild animals which depend upon a fire-origin habitat, and how the species are maintained under forest management.	_____	_____
g. Describe 3 major differences between eastern and western fire management in the United States (fuel types, climate, severity of burning, relative costs to control, causes, etc.).	_____	_____

7. FOREST SERVICE - CORE OBJECTIVE

a. Through discussion with various members of the U.S. Forest Service in camp you will be able to describe the purpose and various dimensions of the Forest Service as well as the concept of multiple use and sustained yield in Forest Management.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
8. FORESTRY INVESTIGATION		
a. Given a prepared cross-section of a tree and through a discussion with a forester, describe how a tree grows both in length and in diameter. The age will be determined along with 3 observations about the cross-section provided. Infer possible reasons for each observation.	_____	_____
b. Construct a diagram of the natural process occurring in a rotting stump or log.	_____	_____
c. Upon sight of members of a collection or in the natural environment, be able to give the correct common name for at least 50 different species of plants in the Sprinkler Lake area.	_____	_____
d. Verbally discern between even-aged and uneven-aged forest management and describe three effects of each system on the biology of the forest.	_____	_____
e. Describe the three major forest types of the Huron National Forest area and how they originated: Jack and Red Pine, Aspen, Oak.	_____	_____

OPTIONAL OBJECTIVES

1. Working with Sue and several insect guides, prepare a collection of insects giving the common name, family name (if possible), and other to which they belong.	_____	_____
2. Working with Gail and provided materials, make and identify a collection of aquatic insects in their various stages of development.	_____	_____
3. Using the Hach Kit, collect data using 5 or more tests to determine H_2O quality of one or more streams or lakes in the area.	_____	_____
4. Using the Hach Kit measure the dissolved oxygen in Sprinkler Lake over a 24-hour period doing 1 test every 3 hours. Explain the probable cause of your results.	_____	_____
5. Using the soil auger, prepare a soil map of a designated area or a variety of habitats.	_____	_____
6. Participate in Sprinkler Lake Weather Station by taking morning and evening records of high and low temperatures, relative humidity, barometric pressure, wind speed and precipation. Attempt daily weather predictions and post in Ad Bldg.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
7. Participate in one or more field trips with Toni's Mother and develop a personal checklist of birds. You will also add names of birds on the camp list visible to all campers.	_____	_____
8. Learn the common names of a variety of reptiles and amphibians found in the Sprinkler Lake area. You may detain for camp interest specimens caught in a make-shift "terrarium" designed only for temporary lodging. Add names of reptiles and amphibians to the camp list.	_____	_____
9. Through selected readings share your findings by participating in or leading a "seminar" on one of the environmentally related areas such as: population, food-hunger, energy crisis, safety of nuclear power plants, land-use, sewage treatment and use, solid waste disposal, extinct species, air pollution, thermal pollution, agricultural pollution, pesticides and herbicides, edible plants, particular habitat and community (oceans, forests, bogs, deserts, lakes, grassland, etc.), or a topic of your choice.	_____	_____
10. Collect and prepare a snack of edible plants and invite your friends (e.g., invite your crew or a group of your choice).	_____	_____
11. Attend a seminar on introductory photography in order to take better pictures. (John)	_____	_____
12. Take your own pictures and develop your slides in camp with the kit provided. Instruction and assistance will be provided. (John)	_____	_____
13. Assist in developing a camp collection of slides to be shown to all campers. (John)	_____	_____
14. Participate in a star and moon gazing tour in order to learn the names, legends and other phenomena observed. (Roger)	_____	_____
15. You will learn the behavior and survival patterns of a particular animal in this area.	_____	_____
16. Make a jar or bottle terrarium for display to take home.	_____	_____
17. Using an increment borer do a comparative study of trees in this area.	_____	_____
18. Using the stream velocity gauge measure the velocity and stream flow along several points in a give stream and interpret the results.	_____	_____

	Date and Staff Initials	
	Knew Before Camp	Learned At Camp
19. Prepare a 2 page summary of timber harvesting and processing on the Huron National Forest. Include data on growth harvest and total volume of timber. Present the finished paper to Mr. Newell.	_____	_____
20. List and describe the progression of changes in the sequence of events: Mature aspen forest in regeneration cut (a) 5 years after cutting, (b) 10 years after cutting, (c) 20 years after cutting, (d) 40 years after cutting. Include a discussion of kinds of ground plants and wildlife found in each period.	_____	_____
21. Measure the site index of a northern hardwood stand and estimate the volume of timber on the area measured.	_____	_____

June 25, 1975

INSTRUCTION SHEET

ENVIRONMENTAL LEARNINGS SCORECARD

Hi again from Ann Arbor!

Based on inputs from your staff, I am sending you scorecard materials tailored to your camp's EE program. These include the behavioral objectives presented in two forms. One is an individual camper copy and the other is a wall-size scorecard on which you can keep track of the progress of all of the enrollees in your camp, and, at the same time, the progress of your education program as a whole.

Presentation to Campers

An appropriate introduction would include some of the following points. The objectives are the staff's way of indicating the kinds of experiences and learnings that they hope the campers will have during the summer. The staff is presenting them in this way so that the campers can be aware ahead of time of what the program is all about and to help the campers become their own teachers about the environment. The scorecard helps the campers keep track of their learnings and it helps the staff keep tabs on how effective their teaching program is. The objectives that are listed are by no means a list of all things campers will learn this summer, but rather the minimum that every camper should leave camp with if the program and the camper do their job.

There is a potential for the scorecard to be viewed as a negative thing, with overtones of testing and other "evils" of the schools which the campers attend during the other nine months of the year. There is also the possibility that the scorecard could lead to an undesired competition among campers or between work crews to get the greatest number of objectives initialed. These things can happen only if the staff lets them happen.

Camper's Copy

There are enough copies for each camper and staff member with additional copies left over for those who lose their copy. One of your options is to use this version in the field (crew leaders could initial things on a work project) and transfer the information to the master scorecard at regular intervals. Keeping track of learnings on the individual record has the potential for increasing camper responsibility for his/her own learning if it is used right. For campers who are hoping to petition for high school credit for their summer program, the scorecard should provide school personnel with sufficiently detailed information for them to decide on the merits of granting credit.

Master Scorecard

There are 50 columns, allowing space to keep track of the progress of 50 campers. Enter the names on the slanted lines at the top of the chart. The rows are the objectives.

Instructions for filling in the cells appear on the bottom of the scorecard. When an objective is completed, enter into the appropriate cell the date and initials of the staff member who is certifying the completion of the objective.

Ideally, you should get some pre-measure -- an indication of which objectives, if any, the camper could complete on the basis of knowledge, skills, or attitudes acquired prior to camp. This could be done by setting aside the first 2-4 days as a time when campers could come to staff members and try to demonstrate ability to complete some objectives. The rationale for this pre-measure is that it provides you with information about your program by indicating those objectives which large numbers of campers may already have completed by virtue of an unusually good school program or some other source. However, at this late date, it may be impractical for you to take this pre-assessment. If you do try it, note that the way you indicate the information is to enter the date and staff initials as before, but you place a circle around these two things.

Summary Form. This very short form will be sent to you about the third week of July. It will provide you with two ways to summarize the scorecard information.

Questions. If you have any questions about the scorecard program, call or write. Call collect to Jere Johnston, 313/764-2560. Write to Jere Johnston, Institute for Social Research, University of Michigan, P.O.B. 1248, Ann Arbor, Michigan 48106.

Notes. Find some place to scribble notes during the summer on the reactions of staff and campers to the program or the revision you would make in your list of objectives.

Feedback Meeting. We are planning to have a meeting in Ann Arbor this September at which representatives of the four camps can give feedback to myself and some of the Washington YCC staff. This will be the time that you help identify the strengths and weaknesses of the program. The meeting will be held on the weekend of September 13th or 20th. Everyone would arrive on Friday night, the meeting would run Saturday from 8 to 5 and Sunday from 8-12. Arrangements for salary and travel costs would be finalized next month, but at this point in time I need to know the date preference of anyone who is only on the summer YCC staff and who would be working at another job (such as teaching) by mid September. I want to have one representative of the camp staff (camp director or below) from each camp (involvement of FS or Bureau line staff will be taken up at a later time). Please decide who on the camp staff would come to the meeting and have that person send me the enclosed postcard indicating a preference for the weekend of September 13 or 20.

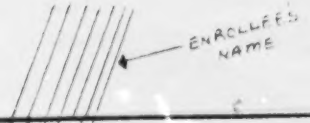
Thanks a lot to all of you. I am well aware that this experiment got started very late and that as a result you had to squeeze other things out of the way to accommodate this endeavor. I hope that everything runs smoothly in your camp (and of course that you achieve all of your objectives!!!).

Jere

Facsimile of MASTER SCORECARD
(42" x 64")

Camp Name _____

ENVIRONMENTAL
LEARNINGS
SCORECARD



NUMBER COMPLETING EACH OBJECTIVE		LEARNING OBJECTIVES	
Beginning of Camp	By End of Camp		
		1. 2. 3. 4.	
		List of Objectives	
		TOTAL NUMBER OF OBJECTIVES ATTAINED:	

-49-

Enter date & staff initials when objective is complete: 7/5 JJ

Circle if completed before camp education program begins: (6/26 JJ)

Summer 1975 -- Experimental Form for EE Scorecard -- Institute for Social Research

CAMP SUMMARY SHEET FOR ENVIRONMENTAL EDUCATION SCORECARD
Youth Conservation Corps

Camp Name _____ Camp Location _____
City State

Form completed by _____

After camp closes the person completing this form can be reached at:

_____
Street Address

_____
City State Zip Code

_____
Telephone (Area Code + telephone number)

---

1. On the Master Scorecard cross out the names and any staff initials of enrollees who were not present for the entire session.

2. Calculate the following items from the Master Scorecard

N.ENR = number of enrollees on the scorecard who were at camp for the entire session _____ N.ENR

N.OBJ = number of learning objectives. Count each objective for which there is a separate line on the Scorecard _____ N.OBJ

3. Summarize how well the enrollees were able to meet your objectives

3a. For each enrollee, sum the total number of learning objectives which have been initialed. Include any initials which have been circled. Put this number in the box at the bottom of each enrollee's column.

3b. Sum across the bottom row on the Master Scorecard _____ SUM

3c. Divide #3b by the number of enrollees in your camp (N.ENR from #2 above) ÷ _____ N.ENR

= [ ] Average number of objectives attained by enrollees

3d. Divide #3c by the number of objectives on your list (N.OBJ from #3 above) ÷ _____

= [ ] Percent of objectives attained by enrollees

[OVER]

4. Evaluating each of the learning objectives.

4a. The two left-most columns of the Master Scorecard should be filled in. Across each row, total the number of circled initials; put this number in the left-most box labelled, "Beginning of Camp." For the same row, total all of the initials -- whether or not they are circled -- and put this number in the box labelled, "By End of Camp."

4b. Pick out the objectives for which you were most and least successful.

MOST SUCCESSFUL

Number reaching the obj.	Objective identifying number	Statement of the Objective

Why do you think so many were able to reach these objectives? (Easy thing to do, intrinsic interest, good staff for this topic, quality of plan for presenting the topic, etc.)

LEAST SUCCESSFUL

Number reaching the obj.	Objective identifying number	Statement of the Objective

Why do you think so few were able to reach these objectives? (Objective too difficult, topic not interesting to teenagers, staff not well-enough prepared to present this topic, poor approach to teaching this topic, ran short of time, etc.)

[Send this sheet and copy of an "Environmental Learnings Scorecard" to: Dr. Jerome Johnston, Institute for Social Research, P.O.B. 1248, Ann Arbor, Michigan 48106]

Environmental Education Scorecard
Summary Data on the Four Camps

	No. Enrollees	No. Objectives	Objectives Approved as Adequate	Ave. No. of Objectives reached by enrollees (as a pct. of total)
A.	46	47	—	96%
B.	19	36	—	68%
C.	39	28	—	89%
D.	No report			

Reasons cited for not reaching all objectives

--lack of time
--a staff person who is essential to teaching one of the objectives was unavailable

Reasons cited for reaching "most successful" objectives

--intrinsic interest
--learning method: learning by doing
--good staff

PARTICIPANTS IN THE
SCORECARD DEBRIEFING CONFERENCE

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John Monsma 218 Sabina McBain, Michigan 49657 (616) 825-2486	EE Specialist Sprinkler Lake YCC Glennie, Michigan
Peter Mowitt Office of Manpower Training and Youth Activities Department of Interior Washington, D.C. 20240 (202) 343-4385	In charge of research and evaluation of YCC for the Dept. of Interior
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Betty Reinke Office of Manpower and Youth Activities Department of Interior Washington, D.C. 20240 (202) 343-9375	Program planning and support for Dept. of Interior YCC program
Robert Schaefer Federal Aid Coordinator Dept. of Natural Resources Mason Building Lansing, Michigan 48926 (517) 373-1750	Federal Aid Coordinator State of Michigan Responsible for state YCC programs.
Paul Stoetzer Box 21 Germfask, Michigan 49836 (906) 586-6942	EE Specialist Seney Wildlife Refuge Seney, Michigan

TRAINING PROGRAM

It was clear from the start of the experiment that some form of training would have to be provided for camp staffs. The term "behavioral objective" is not familiar to most people, even to many who are educators. Thus, it was necessary to train camp staffs in recognizing and writing behavioral objectives. Additional training was necessary to explain how to use the scorecard in guiding the Environmental Education program in the camp.

Five to ten hours was spent in each camp for training purposes. The content of this training is most easily explained by reference to the instructor's behavioral objectives for the training.

Behavioral Objectives for Scorecard Training Session

1. Staff will describe the current EE program in whatever way they think conveys the essential elements of the program.

2. Given three examples, staff will distinguish an enrollee behavioral objective from a program description.

3. Given a description of an EE goal, staff will write a set of corresponding enrollee behavioral objectives.

4. Staff will generate a set of behavioral objectives for EE to be used in their camp this summer.

5. For the set of behavioral objectives, the staff will write a description of the means (projects, activities, etc.) by which the objectives will be achieved.

The first objective was included in order to make sure that the camp staff were clear on what it was they had in mind for the EE program prior to describing the program in behavioral objectives terms. After the staff had specified their program, a brief presentation was made on the meaning of behavioral objectives. This input was necessary if the staff was going to achieve objective two and three noted above.

The fourth objective--generating a set of objectives for the summer--was a very difficult but rewarding activity. In fact, the staffs universally praised the merits of going through this process. It forced them to share with one another their objectives for the summer and in doing so to work out their differences prior to getting into the field with the enrollees. At the end of writing the collection of behavioral objectives they felt that a large portion of the entire summer's program had been laid in place.

The fifth objective stated above was really unnecessary. In effect this was done under objective four. Since most of the behavioral objectives focus on specific work activities, the means for achieving the objectives are an integral part of the objective itself.

The number of people involved in the training program varied from one camp where only the EE instructor was trained to another camp where most of the staff participated in the initial training. Which model is followed depends on a decision made by those responsible for the camp as to who will write the objectives. Anyone responsible for writing objectives obviously needs the training. Whether or not additional staff receive the same training depends on whether they will be asked to actually write some of the behavioral objectives. If their role is only to critique and approve a set of objectives then little or no training is needed for them, since once they are written, behavioral objectives are easily understood by student and teacher alike.

In each of the four camps there was considerable initial resistance to the idea of describing their EE program in terms of behavioral objectives. Part of this resistance was due to the fact that the project started so very late, and staffs were unprepared for an additional activitiy to be carried on during an already-filled training week. But a more basic resistance was identified which is associated with people's general impression of the nature of behavioral objectives and of the scorecard approach. These resistances are described in the recommendations section of this report.

Most of the materials for the presentation of behavioral objectives were based on the book by Robert Mager, Preparing Instructional Objectives, (Belmont, California: Fearon Publishers. 1962.). Key handout materials based on this book are included following this page. Another reference that is recommended for a discussion of behavioral objectives is by Nate Gage and David Berliner, Educational Psychology, (Chicago: Rand McNally, 1975).

Page	Title
35	Psychological aspects of behavioral objectives.
36-47	How to formulate behavioral objectives.
48-67	Different kinds of objectives and how they fit together.
68-80	Being reasonable about behavioral objectives.

While both of these references are very good, they are designed specifically for people teaching in traditional school classrooms where the emphasis is much more academic and "bookish" than in YCC. The EE program in YCC emphasizes learning by doing and the behavioral objectives must reflect this. Accordingly these references are of greatest value to YCC staff trainers who can read them and make the appropriate translations. If the scorecard program continues to be used in YCC, consideration should be given to writing a programmed text similar to Mager's book. This would allow a YCC staff person to understand behavioral objectives in a 40-minute session by himself.

DISTINGUISHING TEACHING OBJECTIVES FROM STUDENT BEHAVIORAL OBJECTIVES

TEACHING OBJECTIVES	EQUIVALENT STUDENT BEHAVIORAL OBJECTIVES
Topic: Soil study	
1. Give experience in a technique of analyzing soil types.	1. Using a soil sample kit: a. Correctly draw a sample of soil b. Identify the Ph, Nitrogen, Phosphorous and Potassium levels in the sample
2. Demonstrate that soil is made up of several components.	2. Define and distinguish among sand, silt, clay, humus. 3. As a part of a sedimentation study, determine the fractions of each soil type.
3. Create an awareness that soils differ in different locations.	4. Correlate flora with soil type, identifying two species that correspond to each part of the Ph range. 5. Explain what indicator species tell you about soil Ph in an area.
Topic: Invertebrates in wildlife areas	
4. Familiarize students with killing invertebrates for a comparative study involving kinds and number.	6. On visits to four different areas: a. Collect invertebrates in a "kill" jar b. Identify the characteristics of each invertebrate (body, legs, wings, and other obvious external features)
5. Give students ability to classify invertebrates.	7. Develop a dichotomous key for the invertebrates.
6. Encourage awareness that populations of animals differ in different invertebrates.	8. Describe ways in which the invertebrates of each area are the same or different and give reasons for the difference.

FOUR TRAINING AIDS USED IN BEHAVIORAL OBJECTIVE PROGRAM

ELEMENTS IN WRITING BEHAVIORAL OBJECTIVES

1. Identify the terminal behavior expected of a student
2. Specify the conditions under which the behavior is to be performed
3. Specify the criterion of acceptable performance

A LIST OF PROGRAM DESCRIPTIONS AND BEHAVIORAL OBJECTIVES WHICH IS WHICH?

1. Familiarize campers with the characteristics of soils.
2. Have campers appreciate the importance of soil to plant growth.
3. Given a soil profile, campers will identify all the zones of the soil and describe the chemical structure of each.
4. Give two ways in which structure affects plant growth. Given highly compacted soil, tell two ways in which you could change the soil structure to improve plant growth.

THE KEY TO GOOD BEHAVIORAL OBJECTIVES LIES IN THE VERB: WHICH VERBS ARE MOST APPROPRIATE FOR BEHAVIORAL OBJECTIVES?

to know
to understand
to really understand
to appreciate
to really appreciate
to fully appreciate
to grasp the significance of
to enjoy
to believe
to have faith in

to write
to recite
to identify
to differentiate
to solve
to construct
to list
to compare
to contrast

"LEVEL" OF BEHAVIORAL OBJECTIVES

1. Simple (identify, cluster)
   Ex: Identify the three basic soil types....
2. Generalization/implication
   Ex: Tell two ways in which soil texture affects plant growth.
   Ex: Demonstrate in your own decision-making an awareness that that every action has more than one impact; that the action "ripples" throughout the ecosystem.
3. Descriptions of exposures/activities. No outcomes specified
   Ex: Participate in the planning and carrying out of: (a) an overnight backpack trip including identifying edible foods, etc.; (b) day hiking (map reading, rock scrambling, etc.); (c) river canoeing.

SENEY TEACHING OBJECTIVES BEFORE TRAINING

The Seney education program is an example of an EE program that was carefully thought out ahead of time, but was expressed in terms of teacher objectives, not student behavioral objectives. Compare this list with the scorecard.

1. Familiarize students with killing invertebrates for a comparative study involving kinds and number.
2. Encourage awareness that populations of animals differ in different invertebrates.
3. Ability to classify invertebrates.
4. Give experience in a technique of analyzing soil types.
5. Demonstrate that soil is made up of several components.
6. Create an awareness that soils differ in different locations.
7. To expose students to the conditions of a relatively undisturbed natural area.
8. To familiarize students with handling a measuring device and collecting data from it.
9. To demonstrate that soil temperatures vary under different environmental conditions.
10. To understand man's dependence on his environment.
11. The effect of man on his environment.
12. Impact of man on his environment.
13. Familiarize students with man's attempt to aid in reproduction of aquatic life.
14. Encourage students to identify species.
15. Realization of a kind of pattern to be found among various water sources.
16. Attempt to draw correlations between elevation of temperature, composition of stream bottom and organism types.
17. Understand stream pattern.

Seney Teaching Objectives, continued

18. Understand that similarity among natural communities is a result of the similarity among interacting variables.
19. Ability to map stream height, etc.
20. Identify aquatic life in stream.
21. Examining habitat of beaver.
22. Examining beaver dam construction.
23. Examining beaver huts vegetation.
24. Examining surrounding terrain.
25. Examining acquatic terrain.
26. Understand the growth of pond vegetation.
27. Being able to classify aquatic vegetation.
28. Understand development of G.T.
29. Understand receding water.
30. Understand development of dunes coastline.

TYPES OF BEHAVIORAL OBJECTIVES
USED IN YCC SCORECARD EXPERIMENT, SUMMER 1975
(Numbers in parentheses are the number of objectives of this type in the four experimental camps)

THINKING/REASONING BEHAVIORS

(99) 1. *Lowest level, demonstrating acquisition of information:* identify (21), describe (37), define (15), recite (13), name or indicate (5), list (8).

(44) 2a. *Higher level requiring some synthesis or problem-solving:* analyze (4), explain (9), compare (2), propose and defend a solution to a problem (4), discuss (4), share views (1), correlate (1), predict (2), estimate (1), interpret (1), plan an activity (1), relate (1), cite an example (13).

(6) 2b. *Higher level requiring some synthesis or problem-solving AND resulting in a visible product:* develop a dichotomous key (1), write an essay (2), take and record readings (1), add information to a chart (1), record results (1).

ACTIVITIES

(28) 3. *These have a thinking component but the emphasis is on the action:* collect (5), locate (2), do a soil or water analysis (4), conduct a visual examination (1), live-trap beaver (1), construct [a stream sampling screen, nesting box, etc.] (4), take pictures (1), set compass bearings (1), send a water sample to state lab requesting an analysis (1), view films (1), attend seminar (1), measure the site index of a northern hardwood (1), spend time in an activity (1), make bread or grind flour (1), measure (3), lead a seminar.

AFFECTIVE OR EMOTIONAL

(5) 4. work cooperatively (1), show a recognition of the presence of natural phenomena (1), analyze your life style (2), communicate your feelings (1).

[It is not necessary that a camp have specific affective objectives. It is reasonable to assume that attitude formation comes indirectly as a result of participating in all the other activities.]